

Creating high-availability power solutions for the ProLiant ML570 server

best practice



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Abstract

Providing redundant power is imperative for maintaining high availability of servers. Therefore, the ProLiant ML570 server was designed to support hot-pluggable N+1 redundant power supplies. The way those power supplies are configured, however, is equally important for maintaining server availability. This paper explains common power configurations that can reduce server reliability and describes an optimum solution using a dual-input power distribution unit (PDU) to provide fault resilience for the ProLiant ML570 server in mission-critical environments.

Power supplies in the ProLiant ML570 server

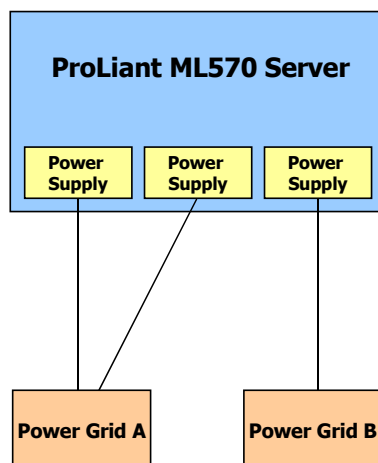
To provide unmatched reliability and the highest levels of availability, the ProLiant ML570 server is designed to support N+1 redundant power supplies. Depending on the configuration requested by the customer, the ProLiant ML570 server ships with two or three hot-pluggable power supplies. While two power supplies are required to power the server, another power supply can be added to provide redundant power for the server.¹ Then, if one of the standard power supplies fails, the optional power supply will take over the load of the failed power supply to maintain server availability. For more information on the ProLiant ML570 server, please visit www.hp.com/servers/proliantml570.

Single points of failure in typical power configurations

To increase redundancy, many data centers are now providing AC power feeds from two separate power grids. In theory, an environment with two power grids would provide availability for the server in the event of a power outage. However the redundancy of a server with three power supplies can be compromised in this situation.

Typically, two of the server's power supplies would be connected to one power grid, and the third power supply would be connected to the second power grid (as shown in Figure 1).

Figure 1: Typical power supply configuration in an environment with two power grids

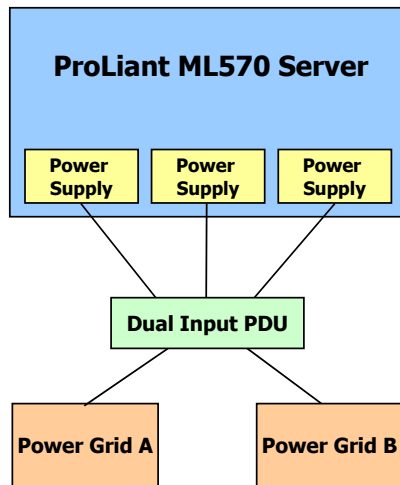


¹ Although the ProLiant ML570 server is designed to support 2+1 redundancy, certain configurations can run in redundant mode using only two power supplies. To enable 1+1 redundancy, the default power supply configuration must be changed during ROM-based setup. For more information about 1+1 redundancy for this server, please refer to the QuickSpecs for the ProLiant ML570 server.

With the configuration illustrated in figure 1, an outage from power grid A (with the two power supplies connected) would leave only one available power supply—not enough to support a maximum configuration of the server. In this worst-case scenario, the server would not only lose redundancy, but it might also lose availability.

To provide redundancy in the event one of the power grids fails, some customers may decide to implement a dual-input PDU as illustrated in Figure 2. A dual-input PDU provides fast, automatic AC failover from one input source to the other in case of a failure. If one of the power grids fails, the dual-input PDU will use the backup power grid to supply power to the server.

Figure 2: Typical power supply configuration using a dual-input PDU in an environment with two power grids

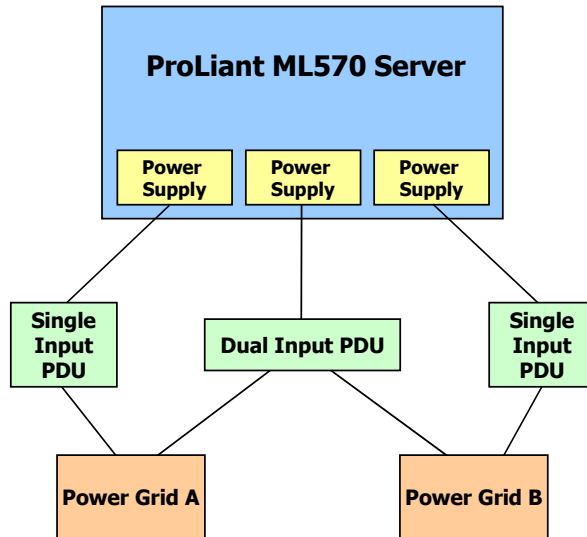


Although this configuration appears to be an effective solution to provide server redundancy, it creates another problem: this configuration creates a single point of failure at the dual-input PDU. Failure of the dual-input PDU is unlikely, but a higher level of redundancy can be achieved with a combination of PDUs.

Solution for full redundancy

Full redundancy for the ProLiant ML570 server can be achieved in an environment with two power grids by combining one dual-input PDU and two single-input PDUs (Figure 3). In this configuration, each of the three power supplies is connected to a different PDU, and only one of them is connected to the dual-input PDU.

Figure 3: Fully redundant configuration in an environment with two power grids



The dual-input PDU is equipped with two inputs and a built-in AC transfer switch. If one of the power grids fails, the power supply connected to the dual-input PDU will switch to the secondary power grid. Although one power supply will no longer be available, the other two power supplies will maintain availability of the server. Likewise, if one of the PDUs fails, the other two PDUs will ensure the availability of at least two power supplies—and the server.

Another benefit of using the dual-input PDU is that options such as KVM switches, monitors, and network switches can also gain increased reliability when they are connected to the dual-input PDU.

To benefit from this configuration, customer environments must meet certain requirements. First, the environment must be a high-voltage (200-240 VAC) facility. Additionally, the facility must provide either two L6-30R wall outlets or two IEC309 wall outlets for the dual-input PDU, plus two additional wall outlets for each of the two single-input PDUs.

More information on PDU amperage capacity and outlets can be found at <http://h18004.www1.hp.com/products/servers/proliantstorage/power-protection/pdu.html>. Also, details and part numbers for specific supported PDUs, cords, and options can be found in the QuickSpecs for the ProLiant ML570 server.

Conclusion

HP offers a wide range of power protection products for computer equipment ranging from individual workstations to servers to distributed enterprises. HP PDUs offer unparalleled power protection and distribution for rack-mounted servers and server options.

Equipped with two inputs and a built-in AC transfer switch, the dual-input PDU is an excellent solution to provide fault resilience for mission critical environments. When used with two single-input PDUs in an environment with two power grids, the dual-input PDU provides a fully redundant solution for ProLiant ML570 servers.

For more information

www.hp.com/go/proliant

HP ProLiant servers

Call to action

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